

Number 305
March 16, 1979

CONTRIBUTIONS IN SCIENCE

NATURAL HISTORY MUSEUM OF LOS ANGELES COUNTY

CHELODESMID STUDIES. VIII.

A NEW MILLIPED OF THE GENUS TRICHOMORPHA FROM COCOS
ISLAND, WITH NOTES ON RELATED SPECIES AND THE PROPOSAL
OF THE NEW TRIBE TRICHOMORPHINI (POLYDESMIDA: CHELODESMIDAE)

By Richard L. Hoffman



Published by the NATURAL HISTORY MUSEUM OF LOS ANGELES COUNTY • 900 EXPOSITION BOULEVARD • LOS ANGELES, CALIFORNIA 90007

The *Science Bulletin* and *Contributions in Science* of the Natural History Museum of Los Angeles County were merged into a single imperial octavo serial, retaining the name *Contributions in Science* and beginning with Number 301.

This serial has been newly formatted for maximum use of typography and illustrations per page, and sized for maximum use of paper. All photography has been produced utilizing a 200-line screen for detail.

Since most institutions rebind *Contributions in Science* collectively into hardbound volumes, and many researchers using them desire to photocopy material, two new features have been incorporated into the new format. A suggested citation line provides the abbreviated serial title, year, number of publication, and total pagination, and appears in the lower left corner of each page; and pages of *Contributions in Science* have been printed off-center to provide a two-inch gutter between adjacent pages for easier accessibility in photocopying.

ISSN: 0459-8113

Suggested Citation: *Contrib. Sci. Natur. Hist. Mus. Los Angeles County*. 1979. **305**:1-7.

Contributions in Science are articles in the earth and life sciences, presenting results of original research in Natural History. *Science Bulletin* (Numbers 1-30; 28 June 1965 to 10 April 1978) and *Contributions in Science* Numbers 1-300; 23 January 1957 to 16 June 1978) were merged into a single imperial octavo serial beginning with Number 301.

Contrib. Sci. Natur. Hist. Mus. Los Angeles County. 1979. **305**:1-7.

CHELODESMID STUDIES. VIII.

A NEW MILLIPED OF THE GENUS TRICHOMORPHA FROM COCOS ISLAND, WITH NOTES ON RELATED SPECIES AND THE PROPOSAL OF THE NEW TRIBE TRICHOMORPHINI (POLYDESMIDA: CHELODESMIDAE)¹

By Richard L. Hoffman²

ABSTRACT: A new species of chelodesmid milliped, *Trichomorpha hyla*, is described from Cocos Island, Costa Rica. It differs from *T. folium* (Brolemann), from the same island in reduced tergal setation, absence of lateral paranotal dentation, lack of middorsal pink spots, and in a less complex gonopod structure. The new tribe Trichomorphini is proposed to accommodate the genera *Trichomorpha*, *Phylactophallus*, *Ancholeptodesmus*, *Belonodesmus*, *Allarithmus*, *Talamancia*, and the new genus *Loomisiola*, based on *Trichomorpha crinitapes* Loomis, 1972, from Costa Rica. The new name *Trichomorpha crucicola* is proposed to replace *T. gracilis* Loomis, 1974, preoccupied by *T. gracilis* Carl, 1914.

Dr. C. L. Hogue, Senior Curator in Entomology in the Natural History Museum of Los Angeles County, recently placed in my hands a small collection of diplopods picked up by him on Cocos Island. Most of the specimens are female pyrgodesmoids and not definitely identifiable to genus or species, but there is one adult male of an undescribed species in the chelodesmoid genus *Trichomorpha*, which is being described here in order to make the name available for use in Dr. Hogue's studies. The occasion is taken to append some additional information on the nomenclature and taxonomy of the genus and related forms.

Trichomorpha, endemic to the region between Ecuador and Costa Rica, is apparently now in the expanding phase of its phylogeny, as the known species are very numerous and yet basically similar in terms of general gonopod structure; specific differentiation is most pronounced in various external non-sexual characteristics. Sympatry and apparent syntopy seem to be common. In most features *Trichomorpha* appears to be a rather specialized genus of chelodesmoids, apparently related to members of the tribe Batodesmini, which has a very similar geographic distribution. Along with several other genera of the northern Andean-Panamanian region, *Trichomorpha* can be segregated into another distinct tribe which is proposed later in this paper.

I wish to express here my thanks to Dr. Hogue for providing the occasion for preparation of the following information about this group of interesting Neotropical myriapods.

FAMILY CHELODESMIDAE

GENUS TRICHOMORPHA SILVESTRI

Trichomorpha Silvestri 1898, Boll. Mus. Torino, vol. 12, no. 305, p. 11. Type species: *T. elegans* Silvestri 1898 (Ecuador), by monotypy.

Ethophallus Chamberlin 1933, Pan-Pacif. Entom., vol. 9, p. 20. Type species, *E. cervantes* Chamberlin 1933 (Costa Rica), by original designation.

Typophallus Chamberlin 1940, Bull. Univ. Utah (biol. ser.), vol. 5, no. 6, p. 10. Type species, *T. evidens* Chamberlin 1940 (Panama) by original designation.

Desmachrides Chamberlin 1940, op. cit., p. 11. Type species, *D. dichrus* Chamberlin 1940 (Panama), by original designation.

DIAGNOSIS: A trichomorphine genus in which the gonopod prefemur is short to moderate in length and the femur greatly reduced or absent, the solenomerite appearing to originate at the end of the prefemur; postfemoral elements simple to complex in form, but usually partially enclosing solenomerite. Coxa with prominent dorsal apophysis. Anterior legs of males with large distal tibial pad, subtending the tarsus; in some species the coxa and femur of the 7th pair of legs are lobed or otherwise modified. Anterior sterna with or without paramedian processes or lobes. Prefemora of some or all legs usually with apical spine in both sexes. Antennae long and slender, extending back at least to paranota of 3rd segment.

NOTES: About 40 specific names have been based upon specimens referable to this genus, as well as a number of unjustifiable generic names. Loomis (1964, 1972) has shown some of these names to be synonyms and so reduced the total somewhat, but a number of undescribed species at hand, and the small fraction of the generic range that has been sampled thus far, suggest that eventually as many as 200 species of *Trichomorpha* may be discovered.

In 1972 Loomis merged the name *Ethophallus* with *Trichomorpha*, but in a later paper (1974) kept the two separate on the

¹REVIEW COMMITTEE FOR THIS CONTRIBUTION.

CHARLES L. HOGUE
W.A. SHEAR
ROWLAND SHELLEY

²Professor of Biology, Radford College, Radford, Virginia 24142.

basis of a supposed difference in proportions of several podomeres. Having the opportunity to study type material in the collection of the late R. V. Chamberlin, I can verify that *Ethophallus cervantes* is in fact only a species of *Trichomorpha* and the 'difference' in lengths of the tibia and tarsus entirely illusory. At the same time I can confirm Loomis's disposal of the two names *Typophallus* and *Desmachrides* as strict junior synonyms of *Trichomorpha*.

The name *Trichomorpha gracilis*, proposed by Loomis in 1974 for a Costa Rican species, is preoccupied by *Trichomorpha gracilis* Carl 1914, from Colombia. On learning of my intention to describe the Cocos Island species, Mr. Loomis asked me to use the occasion to provide a new name for his *gracilis*. I hereby propose the new name *Trichomorpha crucicola*, in reference to the type locality (Finca las Cruces, near San Vito, Costa Rica).

Trichomorpha hyla NEW SPECIES

Figures 1–8

Holotype. — Adult male (LACM) collected at Wafer Bay, Cocos Island, Costa Rica, 18 April 1975, by Charles L. Hogue.

DIAGNOSIS: A moderate-sized member of the genus characterized by the smooth metaterga, each with only two setae; presence of tibial pads on legs 2–6 of males; denticulate posterior edge of most paranota; occurrence of paramedian processes on the sterna between legs of the 2nd, 3rd, and 5th pairs, and of a prominent basal lobe on the femora of the 7th pair; and by the relative simplicity of gonopod structure, the acropodite set off by a distinct suture and virtually without any lobes or processes.

DESCRIPTION: Body ca. 17.0 mm in length, 2.1 mm wide over most body segments, W/L ratio about 12.4%. Body generally light brown. Metaterga pale testaceous brown, fading to nearly colorless on the paranota, dorsal surface of prozona darker brown, imparting a somewhat annulate appearance with low magnification. Labrum and clypeus nearly colorless, basal antennomere very pale brown, 2nd–6th antennomeres fuscous, 7th nearly white. Podosterna and midventrum of prozona whitish, basal four podomeres also nearly white, tibia light brown, tarsus dark brown except for apical fourth which is white.

Head of normal appearance for the genus, front with sparse, prominent, setiferous punctures; epicranial suture fine but distinct down to level of antennae; genae convex, lateral margin narrow but well-defined, with five or six marginal setae. Ventral edge of labrum marginate except proximad to median teeth; 8–8 labral setae. Interantennal space broad, wider than length of 1st antennomere. Antennae long and slender, articles 5 and 6 with well-defined, oval, white, sensory field on outer distal surface. Sensory cones small, indistinctly grouped into two diads.

Collum about as wide as head, surface convex, smooth and polished; lateral ends acute, forming about a 70° angle, lateral edges set off up to level of mandibular articulation. 8 setae along anterior margin, and 4 in a transverse row approximately at mid-length.

Body segments not deeply telescoped, paranota thus well-separated, subsegments not strongly separated, stricture shallow, its anterior edge sharply defined. Paranota well developed, set high on body and nearly horizontal, middorsum somewhat convex, surface of metaterga smooth and polished, with two paramedian setae; transverse sulcus evident on segments 5–17, dorsal surface of paranota slightly convex basally. Posterior corners of all para-

nota acute, becoming increasingly prolonged and subspiniform back to about segment 17, posterior edge of most paranota distinctly denticulate, lateral edge with prominent offset at mid-length on segments 2–7, thereafter nearly smooth and straight (Figs. 1, 2); ozopores opening dorsolaterad, peritremata moderately developed, elongate, not set off from remainder of paranotal edge; anterior corners of paranota with a prominent denticulation. Paranota of segment 19 small, curved mesad.

Epiproct of normal shape, but lateral and apical dorsal tubercles a little more prominent than usual (Fig. 3). Paraprocts and hypoproct without peculiarities.

Sterna of midbody segments broad (about equal to combined length of coxa and prefemur), slightly elevated above prozona, smooth and glabrous, with indistinct transverse groove, no subcoxal spines or lobes. Stigmata minute, without raised edges. Side of metazona smooth. Pleurosternal carinae visible only on first two or three segments. Prefemora with prominent apical spine from 2nd to 18th pair of legs. Tibial pads present on legs of 2nd–6th pairs, much the largest anteriorly where about 2/3rds length of tarsus. Tarsal claw small and straight.

Gonopores opening flush with surface of coxae of 2nd pair of legs. Sternum between 3rd pair of legs with two small paramedian lappets, that between 4th pair of legs with very large, compressed, divergent, apically truncated processes (Fig. 4), that between 6th pair of legs with two small contiguous acutely conical projections (Fig. 5). Coxae of 6th and 7th legs produced ventrad, the projection especially prominent on 7th legs, the femora of which are provided with a large proximal lobe or process on the ventral side (Fig. 5).

Gonopod aperture transverse, lateral and posterior edges produced ventrad, anterior edge unmodified; gonopods projecting forward over sternum of 6th segment, of the form shown in figures 6–8. Coxae without median sternal remnant (Fig. 6), the dorsal apophysis robust, with two setae; telopodite attached at a right angle to coxa, nearly straight, setose prefemoral region about one-third total length of telopodite, femoral region strongly reduced and indicated only by the point of origin of the solenomere; latter slender, nearly straight, its entire length visible in mesal aspect (Fig. 8); postfemoral region a simple, spatulate, apically concave process with a small thin lamella on the dorsal side. Lateral side with a prominent postfemoral cingulum (Fig. 7, C).

NOTES: Dr. Hogue supplied the following information on the habitat of this species (in litt., 19 September 1975): "All of this material definitely came from bromeliads, although the collecting occurred fairly close to ground level, approximately 4–6 feet. The specimens were taken from very large plants growing on downed logs and branches of *Hibiscus tiliaceus*, a mangrove species. The ground beneath the site from which the millipeds came was flooded by high tide twice daily."

The relationships of this species are not easy to establish. There are now about 35 presumably valid species of *Trichomorpha*, 22 of them described from Colombia, 5 from Panama, and 6 from Costa Rica. Attems (1938) gave a key to 20 South American species, but was unable to include most of the forms named by Chamberlin because of inadequate descriptions. An additional member of this genus (*T. folium* Brolemann 1903) was misplaced by Attems in *Camptomorpha*, where it has no affinities whatever.

T. hyla will not trace through Attems' 1938 key at all, being excluded by both of the choices in the first couplet (metaterga

with numerous irregular setae as opposed to setae in two or three transverse rows). In this species each metatergum has only a single row composed of two setae, placed paramedially behind the transverse sulcus (increasing to four on the last few segments). On the basis of "best fit" we select the second choice, *T. venusta* Carl 1914, from Colombia, but *hyla* differs from this form in a number of ways including a different gonopod structure.

Of the four Panamanian species keyed by Loomis (1964), *hyla* runs out to *T. nidicola* Chamberlin, but differs in lacking a pale middorsal line and lateral paranotal dentations (four to six prominent teeth in *nidicola*).

Six Costa Rican species are keyed by Loomis (1972), of them *hyla* comes closest to *T. folium*, coincidentally the *Trichomorpha* already known from Cocos Island.

In light of present knowledge of the genus, it seems impossible to confidently relate *T. hyla* to any mainland species, and for the present it may be justifiable to consider it a valid species endemic to Cocos Island. In this respect then, comparison needs be made primarily with *T. folium* (Brolemann).

This species was supported by a detailed description and good drawings, and the following points of difference may be noted: *folium* is slightly longer and more robust than *hyla*, its W/L ratio 14% as opposed to 12%; the metaterga in *folium* are reddish-brown with a series of middorsal red spots and the legs are uniformly yellowish; although Brolemann did not allude to tergal setation generally, he stated that the collum has three transverse series of hairs and generally the arrangement of the collum persists on the metaterga as well. In *folium* the paranota are laterally dentate (nearly smooth in *hyla*); the femur of the 7th pair of legs lacks the prominent basal lobe found in *hyla*; and the gonopod telopodite is provided on its dorsolateral surface with three triangular projections not present in *hyla*. There is no doubt whatever that they are quite different, despite some points of similarity such as lobation of the anterior sterna and general gonopod pattern.

Loomis (1972:192) suggested that perhaps *T. evidens* (Chamberlin) from the Canal Zone is a junior synonym of *folium*. I have been able to study the type material of *evidens* and find it to be quite different from *folium*; among other things *evidens* completely lacks processes on the anterior sterna and it is moreover the least setose of known *Trichomorpha* species. I was unable to locate either setae or setal sockets on any of the terga.

The present opportunity is taken to implement a long-standing intention, to formally recognize a suprageneric taxon to include *Trichomorpha* and related genera within the subfamily Chelodesminae:

Trichomorphini NEW TRIBE

DIAGNOSIS: Small (9–24 mm) chelodesmoids in which the gonosternum is reduced or lost; gonopod aperture transversely narrow with flared edges; gonopod coxae with prominent dorsal apophyses; femoral region of gonopod very short and merged with end of prefemur, solenomerite appearing to originate from prefemur; without prefemoral process; solenomerite long and slender, usually partly or entirely enveloped within the postfemoral region, latter straight or strongly curved dorsad.

Body parallel-sided, none of anterior segments broadened or narrowed, relatively slender; segments not deeply telescoped into

each other. Antennae long and slender, with sensory fields on outer side of articles 5–7. Mandibles relatively large. Collum hemispherical and convex. Paranota of moderate size and usually set high on sides; at least some metaterga with transverse sulcus (usually segments 5–17), and most species with at least two or three transverse rows of setae; pore formula normal, pores opening dorsolaterad in elongated peritremata, latter continuous with edge of paranota. Epiproct usually with enlarged lateral and subterminal tubercles. Sterna relatively broad and flat, at most produced into low subcoxal cones. Anterior legs of males usually with tibial pads subtending tarsi, often coxae and prefemora variably lobed or otherwise modified.

COMPONENTS: *Trichomorpha* Silvestri 1897; *Ancholeptodesmus* Brolemann 1919; *Belonodesmus* Chamberlin 1918; *Allarithmus* Attems 1933; *Phylactophallus* Pocock 1909; *Talamancia* Loomis 1974; *Loomisiola* new genus.

DISTRIBUTION: Northern Cordilleran region, from Ecuador to Costa Rica, east as far as Trinidad.

REMARKS: All of the generic names listed above are subject to major change when sufficient material is at hand for a revision of the group. Some may prove to be junior synonyms and *Trichomorpha* itself may be divided into two or more smaller genera. Loomis (1964, 1972) reduced the Chamberlinian names *Typophallus*, *Desmachrides*, and *Ethiophallus* to the synonymy of *Trichomorpha*, and it seems quite possible, on the basis of published information, that *Ancholeptodesmus* and *Allarithmus* may suffer a similar fate.

I know the genus *Phylactophallus* only from Pocock's original description, but it seems to be based on a trichomorphine species, and to be a distinct genus. I think it is very likely that *Isidrona forficula* Attems (1933) is a generic and probably also a specific synonym of *P. stenomerus* Pocock. In the "Checklist" of Central America millipeds, Loomis (1968:15)—on the basis of a suggestion made by me *in litt.* many years ago—combined the names *Phylactophallus* and *Allarithmus*. I now suspect that my opinion was based upon a confusion of two names (*Allarithmus* instead of *Isidrona*), in any case it was egregiously incorrect.

Most of the species referred to *Trichomorpha* and its satellite genera have the gonopods formed on a basically similar pattern. One Costa Rican species, however, is so divergent that some kind of recognition in a separate status seems desirable.

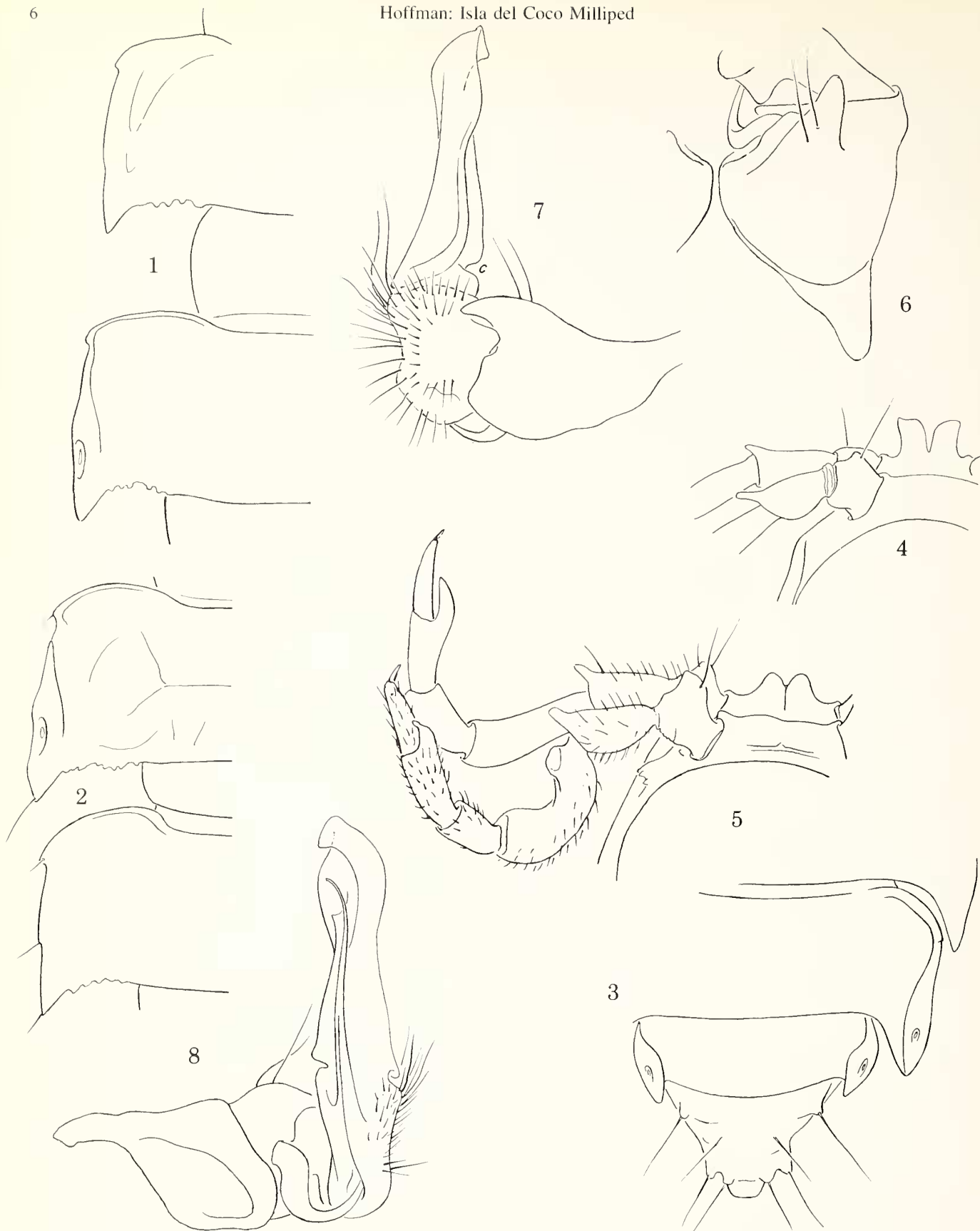
Loomisiola NEW GENUS

Type species.—*Trichomorpha crinitapes* Loomis 1972.

DIAGNOSIS: A trichomorphine genus differing peripherally from *Trichomorpha* in having shorter and stouter antennae, and paranota with less prominently produced posterior corners. The gonopod prefemur is unusually long, distally broadened, and provided apically on the lateral side with an oblique lobe set with numerous long slender setae; postfemoral elements of gonopod strongly reduced.

DISTRIBUTION: *Loomisiola crinitapes* is known so far only from the original type material, taken at Cairo, Province Limon, Costa Rica.

ETYMOLOGY: It is appropriate that this taxon commemorate the name of H. F. Loomis, who has contributed most to our knowledge of Central American and Antillean Diplopoda, in numerous papers spanning four decades.



FIGURES 1-8. *Trichomorpha hyla*, structural details, from holotype. Figure 1, left paranota of segments 8 and 9, dorsal aspect. Figure 2, left paranota of segments 13 and 14, dorsal aspect. Figure 3, posterior end of body, dorsal aspect. Figure 4, sternum and bases of right legs of segment 5, aboral aspect. Figure 5, sternum and right legs of segment 6, aboral aspect (setation omitted from anterior leg). Figure 6, coxa and base of telopodite of right gonopod, dorsal aspect. Figure 7, left gonopod, lateral aspect (c, cingulum). Figure 8, left gonopod mesal aspect. Figures 1-5 drawn X45, 6-8 X 90.

RESUMEN

Se describe una especie de la familia Chelodesmidae, *Trichomorpha hyla*, que se encuentra en la Isla del Coco de Costa Rica. Se diferencia de *T. folium* (Brolemann 1903) de esa misma isla en la setación dorsal reducida, en la ausencia de dentación de los paranota, y en una estructura gonopoda menos compleja. Le nueva tribu Trichomorphini se propone para acomodar los géneros *Trichomorpha*, *Phylactophallus*, *Ancholeptodesmus*, *Belonodesmus*, *Allarithmus*, *Talamancia*, y el nuevo género *Loomisiola*, basado en *Trichomorpha crinitapes* Loomis 1972, de Costa Rica.

LITERATURE CITED

- ATTEMS, C. 1933. Neue Polydesmiden von Costa-Rica. Ann. Naturh. Mus. Wien 46:257–269, figs. 1–20.
- . 1938. Fam. Leptodesmidae, Platyrrhacidae, Oxydesmidae, Gomphodesmidae, in: Das Tierreich 69:1–487, figs. 1–509.
- BROLEMANN, H.W. 1903. Myriapodes recueillis a l'Isla de Cocos par M. le Professeur P. Biolley. Ann. soc. Ent. France 72:128–142, text figs. 1–10, pl. 1, figs. 1–18.
- . 1919. Myriapodes, in: Miss. Arc Merid. equat. Amer. Sud 10 (2):235–275, figs. 1–42.
- CARL, J. 1914. Die Diplopoden von Colombien nebst Beiträgen zur Morphologie der Stemmatoiuuliden. Mem. soc. Neuchatel. sci. natur. 5:821–993, figs. 1–262.
- CHAMBERLIN, R.V. 1918. The Chilopoda and Diplopoda of the West Indies. Bull. Mus. Comp. Zool. 62:151–262.
- . 1940. On a collection of centipeds and millipeds from Barro Colorado Island, Panama. Bull. Univ. Utah, biol. ser., 5(6):3–16.
- LOOMIS, H.F. 1964. The Millipeds of Panama. Fieldiana: Zool. 47(1):1–136, figs. 1–13.
- . 1968. A Checklist of the Millipeds of Mexico and Central America. Bull. U. S. Nat. Mus. 266:1–137.
- . 1972. Millipeds from the Atlantic Lowlands of Costa Rica. Florida Entom. 55:185–206, figs. 1–42.
- . 1974. Millipeds from the southern Costa Rican highlands. Florida Entom. 57:169–187, figs. 1–29.
- POCOCK, R.I. 1903–1910. Chilopoda and Diplopoda, in: Biologia Centrali-Americana, pp. 1–217, pls. 1–15 [fascicle containing *Phylactophallus* issued in December, 1909].

Accepted for publication July 8, 1977.